

Application Serial No. 09/990,326
Group Art Unit 2875

EXHIBIT B
CLEAN PARAGRAPHS OF DISCLOSURE FOLLOWING ENTRY OF THE
PRESENT AMENDMENT

Changes to the Title of the Invention Paragraph [0001] beginning at Page 1, Line 3

A1 [0001] Improvements in Display Signs, Decorative Lighting and Ornaments for
Holiday Seasons

Changes to Paragraph [0009], beginning at Page 3, Line 13
and Continuing to Line 24

A2 [0009] United States Patent No. 4,870,325 teaches a lighting display using LEDs which are powered by a particular circuit as described in the patent to enable flashing or oscillating. There is no particular discussion in this reference as to the structure of the lighting elements. This reference discusses LEDs and their use in lighting. This patent sets out at columns 1 and 2 many of the background problems with incandescent lighting including the power consumption of the well-known Christmas lighting systems. The patent therefore teaches a lighting display device including a string of LEDs connected in parallel, at least one of the LEDs being bi-colour diodes included in an involved pulsing circuitry and switching mechanism which gate the LEDs to on and off positions.

Changes to Paragraph [0013], beginning at Page 4, Line 28
and Continuing to Line 29

A3 [0013] United States Patent No. 5,315,492 describes a window display ornament including LEDs as best seen in Figure 5. Similarly, United States Patent No. 5,239,450 teaches the use of LEDs for use in buttons with a pre-determined message provided on a flat disk of material.

Changes to Paragraph [0015], beginning at Page 5, Line 7

A4 [0015] United States Patent No. 5,495,147 teaches the use of a string of LEDs connected in parallel utilized for decoration and the like including a regulated power supply to provide constant current at a constant voltage as received from an AC line including a step-down transformer to step down the voltage in the range of between 3 and 5 volts AC, a rectifier for rectifying that voltage, a voltage regulator coupled light source and preferred LED to the output of the transformer and a zener diode coupled light source and preferred LED between the rectifier and the voltage regulator for limiting the voltage fed into the voltage regulator from the rectifier.

Changes to Paragraph [0016], beginning at Page 5, Line 17
and Continuing to Line 20

A5 [0016] Many of the devices described above especially since they include LED's provide a pin point light, that is to say a very sharp glaring point of light for Christmas ornaments and decorations. It would therefore be desirable to scatter the light from a light source in a pleasing manner through some of the surface area of the ornament being observed.

Changes to Paragraph [0017], beginning at Page 5, Line 24
and Continuing to Page 6, Line 2

A6 [0017] Nowhere within the prior art to the best of applicant's knowledge is there found; an ornament for holiday seasons; a sign, such as an emergency sign, or a design, such as a company logo; which may be lit by a reliable light source such as light emitting diode by scattering the light produced at much reduced power consumption and substantially reduced operating temperature. It is therefore desirable to provide an ornament/design/sign, in one embodiment suitable for decorating during a holiday season, which would enhance the lighting effectiveness thereof when compared to of an LED on its own.

Changes to Paragraph [0021], beginning at Page 6, Line 17
and Continuing to Line 18

a7 [0021] Further and other objects of the invention will become apparent to those skilled in the art when considering the following summary of the invention and the more detailed description of the preferred embodiments illustrated herein.

Changes to Paragraph [0022], beginning at Page 7, Line 10
and Continuing to Line 22

a8 [0022] According to a primary aspect of the invention there is provided an ornament/design or sign, in one embodiment for decorative purposes, for example Christmas tree ornaments or the like, said ornament/design or sign comprising a solid matrix of material providing a body preferably having a top, bottom and plurality of sides, and having a predetermined shape, preferably formed proximate the top thereof and extending toward the bottom thereof, said body having at least one light scattering translucent surface, groove and/or ridge formed therein, and preferably when the body is providing an ornament, extending about at least some of the perimeter of the body and in one embodiment substantially the entire perimeter of the body, said surface, grooves, ridges or characteristics providing a design, shape, image, letter or character preferably which represents the holiday season, for example a candle, an image of Santa Claus, a crucifix, a heart or the like, all formed by forming and preferably etching the surface, grooves, ridges or characteristics into the matrix of the body of the ornament/design or sign, said body having disposed therein and preferably proximate at least one side thereof an opening having contained therein in use at least one light source, and preferably at least one light emitting diode, (LED) which may be glued or molded in place within the opening, or alternatively loosely fit within the opening, said at least one light source including electrical leads extending to an electrical conductor or alternatively

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to a printed circuit board for the powering thereof; said body in preferred embodiments being manufactured from various materials such as polymethylmethacrylate, acrylic, resins, Lexan® or the like, preferably materials which appear transparent are utilized; the material being of any suitable colour for the holiday season such as amber, red, green, blue, clear, purple, yellow, orange or any shades or combinations thereof; in one embodiment the etching of the body of the ornament/design or sign may further comprise a second etched surface, groove or ridge within the perimeter of the first etched surface groove or ridge, said light source and preferred LED being positioned so as to light the ornament, said light exiting the light source and being dispersed by said light scattering translucent at least one etched surface, groove or ridge so as to create a dispersion of the light which would remain undispersed had the etched surface, grooves, ridges or characteristics not been provided.

Changes to Paragraph [0023], beginning at Page 8, Line 16

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[0023] According to yet another aspect of the invention there is provided a display sign comprising a body of solid material for example, methylmethacrylate, acrylic, resin, Lexan®, or the like, preferably said body being transparent and having sides, ends, and a top and a bottom, said top or bottom having a translucent light scattering surface, ridge and/or groove formed or etched therein which may contain the outline of a symbol, figure, a message, or an international symbol, said translucent surface, ridge and/or groove being formed or etched so as to provide light scattering within said body, at least one of said ends or sides including light emitting diodes contained therein or disposed adjacent thereto to emit light in the direction of the translucent surface, grooves, ridges or characteristics so as to disperse said light substantially uniformly from the top or bottom of the display panel and provide the observer with the displayed impression or message created by the dispersion of the light from the formed or translucent surface, grooves, ridges or

characteristics which would remain undispersed had the translucent surface, grooves, ridges or characteristics not been provided. In a preferred embodiment the transparent matrix is a sign sized so as to fit between a pair of supporting rails in a housing, at least one rail to carry the light emitting diodes, said rails being separated and sized so as to receive the ends or sides of said display sign in a channel in each rail, preferably said LEDs, also being powered by

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- i) a transforming circuit for alternating current, or
 - ii) by a battery for a direct current or the like. The light emitting diodes are interconnected electrically either in series or parallel in an array adjacent said rails within a slot in a channel provided with each rail so as to light the edge of the display sign and direct light toward the translucent formed or etched ridge, groove, or surface containing the outline of the symbol, figure, message, or international symbol.

**Changes to Paragraph [0026], beginning at Page 10, Line 17
and Continuing to Line 19**

[0026] According to yet another aspect of the invention there is provided a method of manufacturing ornaments/designs or signs from a matrix of clear material such as acrylic, methylemethacrylate, Lexan® or the like, said method comprising:

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- (1) identifying a suitable material which may be formed or etched with at least one translucent surface, groove, or ridge;
 - (2) forming the ornament/design or sign from said material, in one embodiment cutting the ornament/design or sign from a sheet of predetermined thickness and in another embodiment molding said ornament/design or sign in a preferred predetermined shape such as a rectangular or a bell shape, a Santa Claus shape, a cross shape, the shape of a bulb, the shape of a Christmas tree, the shape of fruit, the shape of leaves, the shape of stars, the shape of circles, or the like;

(3) forming at least one translucent preferably etched surface, groove or ridge within the perimeter of the ornament/design/sign so as to defuse, refract, and otherwise disperse any incident light falling on or near said etched surface, groove or ridge; in one embodiment etching the material adjacent the perimeter of the shape of the ornament proximate at least one location and preferably at a second location, or for example in the case of a leaf providing the veining outline of a leaf in etched form, or as in the case of Santa Claus providing the facial characteristics with etching or alternatively with fruit providing the etching at the most optimal locations which best simulates the fruit;

APD (4) preferably forming at least one opening in the sign/ornament/design and, preferably inserting a light source and preferably at least one LED within the opening;

(5) providing conductors to engage the light source for providing power to the sign/ornament/design;

wherein the light incident upon the translucent preferably etched surfaces, grooves, ridges or characteristics within the sign, design or ornament will scatter, disperse, refract or reflect enhancing the effective lighting and eye appeal of the sign/design/ornament to a much greater extent than any substantially clear ornament.

Changes to Paragraph [0027], beginning at Page 11, Line 4

AM [0027] In one embodiment the sign formed from practicing the method or the apparatus is a display sign containing a message such as No Smoking, or Fine Dining Here, or Emergency or any such message or advertising that might be displayed to the public so as to obviate the need for neon signs, house numbering, flares, letters or the like. As described above, the sign may be substantially rectangular in shape and may be contained between two display rails and which may alternatively contain an LED array which will be disposed within or adjacent to

all the edge of the display sign so as to provide incident light on the etched surfaces from the edge of the sign.

Changes to Paragraph [0029], beginning at Page 11, Line 27

Q12 [0029] According to yet another aspect of the invention there is provided an ornament comprising a matrix of clear transparent material such as methylmethacrylate, Lexan®, acrylic or the like, said ornament when suitably oriented having a top and bottom or alternatively being of a predetermined shape, for example spherical, in one embodiment, preferably said top and bottom of said ornament and at least said top being formed into the desired shape of the ornament such as a Christmas tree, a circle, a piece of fruit, a Santa Claus, or the like and having a predetermined perimeter, preferably said predetermined perimeter being disposed proximate an outer edge of said top and said bottom having therebetween disposed at least one side, said ornament and preferably said at least one side, having disposed therein at least one opening, said at least one opening for having installed therein a light source such as a light-emitting diode or the like, preferably the top and in some embodiments the bottom of the ornament substantially duplicating the shape of the ornament, said ornament having an etched or otherwise formed light scattering surface, alphanumeric character(s), design(s), or pleasing shape(s) therein, for example if the ornament were shaped as a leaf the design may include the veins of the leaf, if the design were in the shape of the figure of Santa Claus or the head of Santa Claus a likeness would be contained on the top therein, formed and preferably etched into the matrix enhancing the face or figure of Santa Claus, wherein said etching may further comprise at least one compatibly shaped etched design formed by providing in one embodiment at least one groove or ridge portion, or at least one etched surface, extending in predetermined directions to provide said etched design, wherein the material adjacent the at least one surface, groove or channel or the like is substantially translucent or non-

A12 transparent so as to substantially disperse any incident light thereon from the light source in use, the light striking said at least one etched surface, groove, design or the like causing light to disperse and/or scatter from said design to a much greater extent than light passing through a matrix of transparent material, said dispersion or scattering of the light thereby creating a pleasing and more effective ornament.

**Changes to Paragraph [0033], beginning at Page 13, Line 17
and Continuing to Line 18**

A13 [0033] According to yet another aspect of the invention there may be provided an ornament for the holiday seasons comprising a matrix of clear transparent material such as methylmethacrylate, acrylic, a resin or a Lexan® or the like, wherein said ornament has at least one light scattering translucent surface, ridge, or channel formed or preferably etched therein or about the perimeter thereof, said ornament including at least one opening containing a lighting source in use (preferably at least one LED), wherein when lit said lighting source will direct incident light within the ornament upon the light scattering translucent surface, channel or ridge so as to create a more uniform dispersion of light from the ornament as opposed to a point source of light. In a preferred embodiment, the ornaments may be strung together with similar or dissimilar ornaments of alternative shape, colour and design as previously described.

Changes to Paragraph [0034], beginning at Page 13, Line 27

A14 [0034] According to yet another aspect of the invention there is provided a sign manufactured from a single sheet of transparent material as described above, said sign having formed and preferably etched therein at least one light scattering design, symbol and/or a message in any language which may be readily identifiable to an observer, said sign including a transparent matrix of methylmethacrylate, acrylic, resin, Lexan® or the like, or any suitable transparent material of any desired colour

or combination of colours which can be etched or alternatively which can have suitable translucent lettering, or design(s), or the like formed therein by, for example, by vacuum forming or alternative molding techniques, said design(s) or message being preferably formed proximate the top of said sign, said edges of said sign having disposed therewith proximate at least one edge thereof openings for at least one light source preferably disposed in or fixed therein and, in one embodiment said openings having contained therein light sources such as light-emitting diodes when the sign is formed, and which are powered by a source of electrical supply through a conductor, in a preferred embodiment said conductor being engaged with the contacts of said lighting source, wherein when the light sources and the preferred light-emitting diodes are powered, incident light strikes said light scattering translucent surface or etching of said message and/or design and highlights the lettering or design to a much greater extent than light emitting from the transparent sections of the display sign. Alternatively, the light sources and preferred light-emitting diodes are not contained within said edge but are disposed within a module including a printed circuit board and the necessary circuitry for powering the light sources and preferred diodes, the tips of said light sources and preferred diodes may be inserted within the openings of said sign or alternatively disposed adjacent thereto in use. The advantages of providing a display sign with the above-mentioned features includes a reduction in power and heat generated for retail signs now requiring neon tubes or other tubes which are made to custom order. The signs of the embodiments of the present inventions therefore may be formed to any desired size and shape and matrix of letters and design, for example each sign providing the shape of a single letter in one embodiment, or alternatively may have the entire message disposed in one sheet, (for example "No Smoking").

Changes to Paragraph [0038], beginning at Page 16, Line 4
and Continuing to Line 5

Q15 [0038] Light emitting diodes are the preferred light source or a low power consumption performance equivalent which may be powered by A/C current transformed to DC, direct D/C current from a conventional battery source such as disposable batteries or the like, or 12 volt, or solar power or wind power or the like.

Changes to Paragraph [0039], beginning at Page 16, Line 11

Q16 [0039] The design/sign/ornament described may further comprise in one embodiment a light source of at least one or more colours which in co-operation with a switching device may change the colour of ornament, message or design over time. For example Christmas ornaments may change colour as opposed to or in addition to flashing. In another example an emergency road sign may do the same. An audible alarm may also be added.

Changes to Paragraph [0040], beginning at Page 16, Line 17
and Continuing to Line 20

Q17 [0040] The light source may be embedded into the design/sign/ornament when formed, or as an additional step or placed adjacent the surface of the design/sign/ornament when a frame designed to hold the light source in place is used. Further the light source can also be placed on any angle in/on the design/sign/ornament to maximize the amount of light being scattered internally. The angle can vary to allow the light to disperse for the selected, ornament, sign or design.

Changes to Paragraph [0042], beginning at Page 17, Line 7

Q18 [0042] In another embodiment for a display sign a housing, preferably modular including an opposed rail assembly is provided having inserted therein a preferably substantially concave reflective panel adjacent said sign in order to reflect light and

a18 enable use of less LED's while achieving a very satisfactory back light depending on the design/ornament/sign application.

Changes to Paragraph [0063], beginning at Page 21, Line 11

a19 [0063] Figure 17 is a schematic view of the assembly of an edge lit sign including modular LED's for inclusion with said sign and housing for said sign in one embodiment.

Changes to Paragraph [0068], beginning at Page 22, Line 27
and Continuing to Page 23, Line 5

a20 [0068] Figures 6 and 7 illustrate that the matrix may include a groove 15a or 15b of various outlines including lettering or international symbols such as "no smoking", "no entry" or the like. The light scattering groove providing the lettering or symbol may be formed as previously described. It is important that the LED or light source, if an alternative light source is selected, contained within said opening will direct light in a broad direction so that the light will shine up against all of the edges x and y at both sides of the, for example, "G" to enhance all edges of the lettering and not merely the one most adjacent to the LED. This comment rings true with all of the signs and ornaments taught herein. To avoid dark spots a sufficient number of LED's should be used consistent with the design and or message being displayed as best illustrated in Figure 8.

Changes to Paragraph [0070], beginning at Page 23, Line 16
and Continuing to Line 17

a21 [0070] Referring to Figure 8, the same technology may be used for providing within the matrix 10a a message as "Fine Dining" at 15' which is enhanced by the LED's 20a, 20b and 20c inserted within the edge of the matrix. The lettering may be provided either by etching robotically, mechanically by hand, through numerical control, by molding or any other known techniques.

Changes to Paragraph [0072], beginning at Page 24, Line 15
and Continuing to Line 21

022 [0072] Referring now to Figure 11, there is illustrated an block diagram showing the various alternative power supplies for powering a set of ornaments, a sign, or more than one sign or various displays embodying the invention.. The power may come from those sources already known in the art including alternating current from a power supply such as a wind turbine, a solar panel, a portable generator, or from line current depending on the location of the installation of the sign or ornament set being used. For example it would be appropriate in an emergency situation to utilize a generator if it is desired that an alternating current be used with the emergency sign for example, "Road Closed" or "Traffic Incident Ahead" or the like. In a more permanent situation a solar panel would be more suitable or alternatively a connection to a household current may be practical. Finally, for some situations for example, emergency signs utilized when a car is broken down, a battery current source may be more appropriate for example via a connector to a cigarette lighter type port for access to the 12 volt circuit of a car. A battery may be used as a back-up source of power for typical situations. Those skilled in the art will appreciate all the permantations and combinations possible. It may be necessary to gate the current if flashing is desired or provide some alternative type of switching if the sign or ornament or display includes more than one coloured light emitting diode. In this matter, for example a Christmas ornament may light in one colour for a set period of time and then may be switched to light a second LED under the control of an inexpensive controller to change the colours displayed then perhaps alternatively flash depending on the sophistication of the sign. For example, when the invention is utilized for a sign for advertising purposes for a business to replace neon signs or the like, it may be advantageous to have each letter light separately so that they may flash in sequence or in unison to draw the public's attention to the sign. Many other

Q22 configurations are possible as would be apparent to those skilled in the art when reading this entire specification. No limitation is intended whatsoever.

**Changes to Paragraph [0075], beginning at Page 25, Line 24
and Continuing to Line 26**

Q23 [0075] Referring now to Figure 14 there is illustrated a general schematic of a display sign 60 including characters 61 within display sign 60 manufactured from a clear transparent material, as described above, which may be of any colour and having a side edge 60a wherein the LED's may be disposed, whether formed therewith when the sign is made or otherwise included following manufacturing of the sign and openings for the LED's. The lettering 61 may be enhanced by providing compatibly located reflective materials 62 placed behind the lettering 61 so as to improve the amount of light reaching the translucent surfaces 61a of the lettering formed with the sign or when the sign is manufactured by the techniques described above. Alternatively, the sign 60 and lettering 61 may be enhanced for viewing by the public by providing a reflective material behind the sign to further enhance the dispersion of light within the said sign and to minimize dark spots.

**Changes to Paragraph [0076], beginning at Page 26, Line 7
and Continuing to Line 8**

Q24 [0076] Figure 15 also provides an embodiment of display 10 illustrating a etched rabbit 15x having a translucent surface or outline and when light from said LED 20 strikes the etched surface 15x, a pleasing effect is achieved which may further be enhanced by the reflective material 10a outlining the shape of the rabbit which is placed behind the etched surface of the rabbit of the design 10 to minimize dark spots and provide a more efficient ornament.

Changes to Paragraph [0077], beginning at Page 26, Line 16
and Continuing to Line 28

Q25 [0077] In another embodiment as shown best in Figure 16 light emitting diodes 71a and 71b are provided at each end of the ornament 70 made from acrylic 70a which includes flecks of metal 74 disposed within the acrylic material when the ornament 70 is formed. The LED's 71a and 71b will provide red light 73 therefrom or amber light 72 therefrom respectively which LED's may be light simultaneously to be melded together, or alternatively used or flashed or switched so that the ornament 70 may express various combinations of effects. These effects are also meant in this specification for all embodiment of the invention and not in a limiting sense. Reflective flecks 74 disposed within said ornament creates a further dispersion of the light which will be further dispersed by the translucent surfaces on the surface of the ornament as best seen in relation to Figure 13 to thereby minimize dark spots. The ornament therefore would include both the etched surface not shown in Figure 16 and the reflective flecks contained therein at 74 to improve the lighting characteristics of the ornament and obtaining a much more effective ornament in spite of the use of the low power consumption LEDs. In addition as shown in Figure 16B reflective material may be placed on the outer edge of the circular shaped embodiments of the ornament 70. In another embodiment in Figure 16C the ornament 80 includes two halves 82 and 81 wherein compatibly shaped reflective material 83 is contained there between wherein the image I which includes an etched or translucent surface is further enhanced by the reflective material which may be on both sides of material 83. Further an image I may be included on both halves 81 and 82 of the ornament 80.

Changes to Paragraph [0078], beginning at Page 27, Line 10
and Continuing to Line 18

Q26 [0078] Referring now to Figure 17 there is illustrated a modular housing 90 which includes rail portions 91 and 92 provided at the bottom and at the top of the housing

wherein LED circuit boards 94 including LED's 92a may be disposed within either the top or bottom or both the top and bottom rails 91 and 92. The board 94 is inserted into the space 90b with the side edges thereof resting on flanges 90a so that the circuit board directs the LED's proximate the edge 61 of the acrylic panel 60. The panel 60, as shown previously, may include an image or an alphanumeric set of characters in any language providing an emergency sign for example. The edges 61 at the top and bottom are to be light by the array of LED's on the printed circuit board 94 disposed within the rail 91 and 92 in space 90b.

Changes to Paragraph [0079], beginning at Page 27, Line 22

[0079] Alternatively, openings may be provided in the panel 60 proximate the edges 61 as seen in Figure 8 to receive the LED's on the printed circuit board prior to being inserted within the rail 91 and 92. In a preferred embodiment a mirror like reflective panel (whether corrugated or flat) and preferably a concave panel 60' may be provided that fits into the housing 90 as well to further enhance the light emanating from the panel as previously described and the effectiveness and efficiency of the panel when viewed by a member of the public.
